Bilateral Complete Osseous Coalition of the Capitate and Trapezoid

Alexander B. Christ, MD[1] Andrew S. Maertens, BA[2] Andrew J. Weiland, MD[1]

[1] Hospital for Special Surgery, New York, New York
[2] School of Medicine, University of Washington, Seattle, Washington

Address for correspondence Alexander B. Christ, MD, Department of Academic Training, Hospital for Special Surgery, 535 East 70th Street, New York, NY 10021 (e-mail: christa@hss.edu).

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Abstract

Background Isolated capitate–trapezoid coalition is a rare form of carpal coalition with few cases described in the literature and a little insight as to how it should be addressed clinically.

Case Description We present a case of bilateral, a complete osseous carpal coalition between capitate and trapezoid discovered in the setting of atraumatic, symptomatic scapholunate dissociation in a 59-year-old, right-handed mechanic.

Literature Review Published reports of capitate–trapezoid coalition are rare, and there is no consensus as to whether this abnormality is a symptomatic pathology or incidental finding. Most reports describe the finding, but do not recommend a course of treatment; several recommend surgery, but the patient declined or it was not mentioned whether it was performed.

Clinical Relevance Capitate–trapezoid coalition is a rare condition that may present symptomatically or may be found incidentally. Reports are scant, and there are no guidelines for how to address these clinically. We present the first bilateral case report of capitate–trapezoid coalition confirmed with cross-sectional imaging and present a treatment algorithm.

Keywords
- carpal coalition
- capitate
- trapezoid

Isolated capitate–trapezoid coalition (ICTC) is a rare form of carpal coalition (CC), with few examples described in the literature. CC derives from incomplete separation of the cartilaginous carpal bone precursors during the 4th to 8th weeks of development, with a prevalence of approximately 0.1%.[1] Coalitions can be fibrocartilaginous or bony, and complete or incomplete.[2]

Although CC seems to be relatively rare in practice, it may have a higher prevalence than what is clinically recognized. Alemohammad et al found CCs in 19% of 202 cadaver wrists they dissected.[3] In this cohort, five ICTCs were found, comprising 2% of the cadavers. Delaney and Eswar found 1 ICTC in their review of 36 CCs, making it relatively rare in that series.[4] However, very few case reports have been presented in the literature, and treatment recommendations are lacking. Here, we report a case of bilateral, complete bony ICTC confirmed with cross-sectional imaging.

Case Report

A 59-year-old, right-handed mechanic was referred to our clinic for a second opinion of atraumatic right wrist pain of several months in duration. He experienced activity-related pain during work and recreational activities, which had been insidious in onset and increasing in severity. He denied pain at rest or at night. Treatment with nonsteroidal anti-inflammatory drugs had failed to provide relief. The patient denied any previous injuries, surgeries, infections, or problems with either wrist.

Physical examination elicited pain over the dorsal scapholunate area. The patient described deep pain in the same area when he was symptomatic during activity. Wrist range of motion was symmetric to the contralateral side, but the patient experienced pain when the wrist was fully extended. Watson test was positive, and the patient's grip strength was

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decreased compared with the contralateral side. Thumb range of motion was symmetric, as was pinch strength, and grind test was negative.

Radiographs of the right wrist, including radial and ulnar deviation and clenched-fist views, demonstrated SL-interval widening and the ICTC, as well as a coalition of the capitate and trapezoid (►**Fig. 1**). The same radiographic views were performed on the contralateral side, demonstrating an ICTC, but failing to show SL-interval widening (►**Fig. 2**). A magnetic resonance imaging (MRI) had been previously performed, demonstrating a coalition of the capitate and trapezoid, along with a scapholunate ligament tear (►**Fig. 3**). Due to the progressive nature and duration of symptoms, the patient underwent scapholunate ligament repair and dorsal capsulodesis. The ICTC was not addressed as it was felt to be asymptomatic and noncontributory to the patient's problem. At 4 months postoperatively, the patient had nearly symmetric flexion to 70 degrees and extension to 60 degrees, and grip strength had returned nearly equal that of the contralateral hand.

Discussion

In this case report, we present a bilateral ICTC, confirmed with cross-sectional imaging, and associated with unilateral, symptomatic SL-incompetence. ICTC is a rare finding, and only a few cases are described in the literature.[2,4–8] Even rarer still are bilateral cases, of which only two are reported to our knowledge,[6,8] and neither of which have cross-sectional imaging studies to confirm the type of coalition.

We believe our patient's pain and SL-incompetence was not related to his ICTC, as it was bilateral and asymptomatic on the contralateral side. MRI demonstrated only SL ligament tear, without edema in the ICTC or surrounding capsule or structures. His physical examination did not demonstrate tenderness to palpation over the coalition or carpus, but more proximal over the SL interval and wrist joint, with a classically positive Watson test. Also, our patient had complete bony fusions, as opposed to those presented by Peters and Colaris, which were incomplete, and therefore likely symptomatic.[5]

Interestingly, cadaver analyses find ICTCs at a much higher rate than in the clinical population. Alemohammad et al found a prevalence of ICTC of 2% in their cadaver population, all of which were incomplete.[3] Several clinical reports found ICTC made up approximately 3% of all asymptomatic CCs,[2,4] which should make up a much smaller percentage of the overall population if radiographic studies of CC are accurate.

Fig. 1 Radiographs of the right wrist demonstrating ICTC. ICTC, isolated capitate–trapezoid coalition.

Fig. 2 Radiographs of the left wrist demonstrating ICTC. ICTC, isolated capitate–trapezoid coalition.

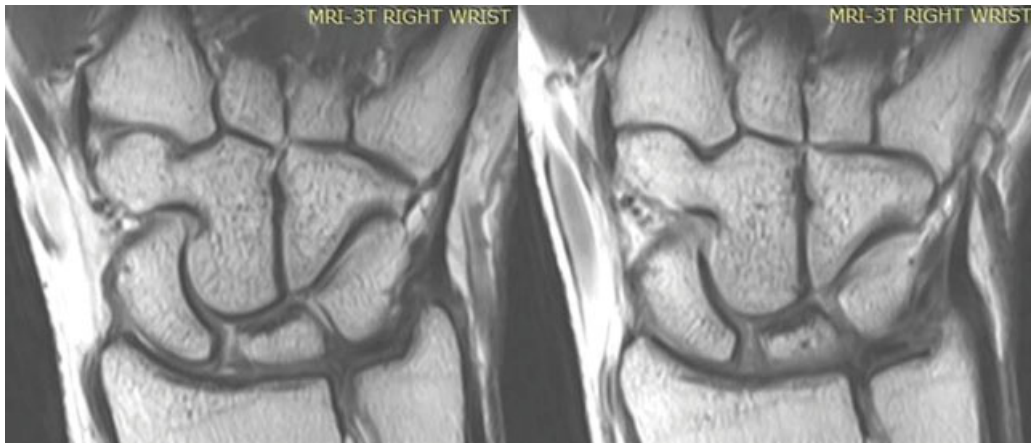

Fig. 3 Coronal slices of proton-density-weighted MRI scan of the right wrist with contrast, demonstrating complete osseous ICTC. ICTC, isolated capitate–trapezoid coalition; MRI, magnetic resonance imaging.

To our knowledge, four cases of ICTC have been described in detail in living patients. Geutjens described a case of unilateral incomplete ICTC, which was symptomatic and confirmed by computed tomographic (CT) scan.[7] Similarly, Peters and Colaris described a unilateral, incomplete ICTC which was symptomatic, demonstrated increased uptake on bone scan, and was confirmed with CT and MRI.[5] Huntley and Hooper described a case of bilateral ICTC associated with ulnar-sided wrist pain and ulnar-positive variance.[6] However, no cross-sectional imaging was obtained, and it was unclear whether the patient's symptoms were related to their ICTCs. Walia et al also described a symptomatic bilateral ICTC in a young boxer, but cross-sectional imaging was lacking in that report as well.[8]

Our patient differs from the previously described cases in that his ICTCs were asymptomatic and confirmed to be complete osseous coalitions on cross-sectional imaging. Given that most true CCs are asymptomatic,[1] it makes sense that the symptomatic cases presented by Geutjens and Peters were incomplete coalitions. We can therefore speculate that the bilateral, symptomatic cases presented without cross-sectional imaging may have been incomplete ICTCs as well. In formulating a treatment algorithm, we believe complete osseous ICTC to be asymptomatic. If the diagnosis or source of pain is in question, the nature of the coalition should be confirmed with CT or MRI. It should be addressed surgically only if it is incomplete or fibrous, and there is no other identifiable source of pathology.

Note

All the work related to this study was performed at the Hospital for Special Surgery, New York, NY.

Conflict of Interest

None.

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